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**Remarks**

Claims 1-20, 22-38, 40, 42-47 are pending in the application. Claims 12, 17, 22, 23, 27, 32, 34, 35, 38, 40 are amended. Claims 41 and 48 are canceled. No new matter has been entered.

In the office action, examiner allowed claims 22, 29, 30, 33, 36 and 37. Claims 28, 41, 42, 44, and 45 are objected to as being dependent on a rejected base claim; however, the examiner indicated these claims recite limitations not taught by the prior art. Claims 1-21, 23-27, 31, 32, 34, 35, 38-40, 43, and 46-48 are rejected. The Examiner objected to the disclosure and claims 12, 21, and 39 for informality. The disclosure is objected to for failing to provide proper antecedent basis for claims 11, 13, 28, and 29. Claim 12 is objected to based on a grammatical error. Claims 21 and 39 are objected to as being of improper dependent form for failing to limit the subject matter of the previous claim.

Claims 2-7, 9, 12-14, 24-26 and 38 are rejected under 35 USC 112, first paragraph. Claims 16, 17, 21, 23, 27, 31, 32, 34, 35 and 39 are rejected under 35 USC 112, second paragraph, as being indefinite.

Claim 48 is rejected under 35 USC 103(a) as obvious under 103(a) in view of Wei (US 6,844,285). Claims 40, 43 and 46-48 are rejected as being obvious under 103(a) in view of Greskovich et al (US 5,484,750). Claims 1-20 are rejected as being obvious under 103(a) in view of Pederson et al (US 5,114,702) in view of Greskovich et al. Claim 21 is rejected as being unpatentable over Greskovich et al in view of Pederson et al.

**Objections for informalities under §112**

Applicant respectfully asserts that examiner's objection to paragraph [0006] of the Summary of the Invention should be removed. The examiner objected to the disclosure of a compact with a powder mixture having yttrium aluminum perovskite, because the other powder

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is not defined in the paragraph. However, the Summary of the Invention does not require the other components of the powder mixture to be disclosed, as long as the Summary of the Invention is commensurate in scope with the claims. Under 37 CFR 1.73, "[a] brief summary of the invention ... summary should, when set forth, be commensurate with the invention as claimed and any object recited should be that of the invention as claimed." Claim 40 recites, *inter alia*, a compact with at least one powder selected from undoped YAG, doped YAG, "a powder mixture having undoped yttrium aluminum perovskite, and a powder mixture having doped yttrium aluminum perovskite". This claim language is commensurate with the scope of paragraph [0008]. As a result, the objection should be removed, because paragraph [0008] is proper.

In regards to claim 11 and 28, paragraph 20 has been amended as shown above to have commensurate scope as the recitations of claims 11 and 28. Amended paragraph [0020] discloses rare earth dopants, and combinations of rare earth dopants. Referring to claims 13 and 29, paragraph [0010] has been amended, as shown above, to have commensurate scope as the recitations of claims 13 and 29. Amended paragraph [0010] encompasses  $\beta$ -alanine and DL-alanine, and combinations of  $\beta$ -alanine and DL-alanine.

Claim 12 has been amended to remove "comprises agent" in accordance with the examiner's suggestions.

The preamble of claims 1 and 22 are amended to clarify the limitations of claim 21 and 39.

Rejections under §112

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Claim 38 has been amended to recite an yttrium aluminum perovskite with "primary particle size between about 30 nm to about 60 nm". This mirrors the size range stated in Paragraph [0019]; therefore, the 112 rejection should be withdrawn.

Paragraphs [0009] and [0010] have been amended, so that the disclosure regarding salts, oxidizing agents, and reducing agents is commensurate in scope with the recitations of claims 2-7, 9, 12-14 and 24-26.

Claim 23 was placed in proper Markush format.

Claim 27 was amended to recite an "oxide of aluminum", in order to establish proper antecedent basis.

Applicant respectfully refutes the examiner's assertion that "the water", as recited in claims 16 and 31, lacks antecedent basis. Independent claims 1 and 22, upon which dependent claims 16 and 31 depend, recite the combining of a salt or oxide of aluminum with a salt of yttrium to form an aqueous mixture. By definition, an aqueous mixture is a mixture that comprises water. Thus, "the water" has proper antecedent basis in dependent claims 16 and 31, because "water" is inherently present in an "aqueous mixture" as recited in independent claims 1 and 22.

Claims 17, 32, 34, and 35 have been amended to recite "is" instead of "comprises" in accordance with the examiner's suggestions.

Rejections under 103(a)

**Claims 1-21**

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As is noted, claims 1-21 are rejected under 35 U.S.C. § 103 in view of Greskovich and Pederson. These cited references, singularly or in combination, do not teach or suggest, all elements of amended claim 1.

Amended claim 1 recites, *inter alia*, a method comprising the steps of: combining at least one salt of aluminum with at least one salt of yttrium to form an aqueous mixture with a mole ratio of 3:5 yttrium to aluminum in the mixture, adding at least one reducing agent and at least one auxiliary oxidizing agent to the mixture, heating the mixture to a first temperature such that the mixture undergoes combustion and a powder is formed, and calcining the powder at temperatures greater than 700 °C to about 1000 °C for an amount of time sufficient to form single phase cubic yttrium aluminum garnet.

The examiner asserts YAG powders are desirable based on Greskovich, which discloses making cubic polycrystalline, ceramic YAG materials from YAG powders. Because of this desirability, the examiner states one of ordinary skill in the art would know to form the YAG powders in Greskovich according to the method of Pederson.

Pederson is cited for teaching a method of forming metal oxide ceramic powders by combining stoichiometric amounts of salts, such as aluminum and yttrium, in an aqueous mixture. Pederson also is cited for teaching adding amounts of amino acid and an ammonium nitrate to the mixture, heating the mixture at a temperature such that the mixture undergoes combustion and forms a powder, and then calcining the powder to form the ceramic. Pederson does not teach the amount and/or ratios of amino acid and ammonium nitrate added to the mixture.

Pederson does not teach all claim limitations of amended claim 1. Pederson does not teach the calcining of powders at temperatures greater than 700 °C. Pederson states calcination

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can be accomplished at temperatures of 700 °C or less. (col. 5, lines 9-11), and emphasizes that high temperature calcination is undesirable because high temperature calcining promotes crystal growth. (col. 1, lines 34-37). The Pederson method also does not teach the production of a powder comprising single phase cubic yttrium aluminum garnet (YAG).

Modifying the teachings of Pederson based on Greskovich does not cure these deficiencies, as the examiner asserts. The examiner cites Greskovich as teaching the production YAG ceramics from YAG powders; however, Greskovich, like Pederson, does not teach calcining at temperatures ranging from greater than 700 °C to about 1000 °C for a time sufficient to form a powder comprising single phase cubic YAG. Furthermore, Pederson teaches away from calcining at the higher temperature ranges of claim 1 by stating high temperature calcining is undesirable. Accordingly, the Greskovich and Pederson do not teach or suggest, singularly or in combination, all elements of claim 1. Thus, claim 1 and its dependent claims 2-21 are in condition for allowance.

Furthermore, the cited references fail to teach the elements of dependent claim 15, which recites that the total moles of the reducing agent and oxidizing agent equals between about 1.4 to 1.5 times the total moles of the Al salt and the Y salt. These ratios control the degree of agglomeration, and produce weakly agglomerated powders, which are critical in the production of polycrystalline YAG and doped YAG.

#### **Claims 22-47**

Independent claim 22 has been allowed. Because all objections and rejections under 112 have been traversed, claims 22 and its dependent claims 23-39 are in condition for allowance. Claim 40 has been amended to incorporate the claim limitation of canceled claim 41, which the examiner indicated was not taught by the prior art. Amended claim 40 now recites, *inter alia*, a

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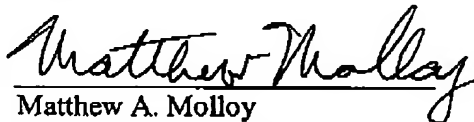
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method for producing polycrystalline yttrium aluminum garnet comprising a step of "sintering said compact in flowing oxygen at temperatures of between about 1600 °C to about 1650 °C for a holding period of between about 5 hours to about 10 hours..." As the examiner has acknowledged, the claim limitation of a holding period of about 5 to 10 hours is not taught by the prior art, thus claim 40 is in condition for allowance, and its dependent claims 42-47 are also in condition for allowance.

The Applicants respectfully submit that, in view of the above amendments and remarks, the application is now in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully requested.

Respectfully submitted,

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